

AMENDMENTS TO THE DRAWINGS

Attached hereto are 3 sheets of annotated drawings and 3 sheets of replacement drawings that comply with the provisions of 37 C.F.R. §1.84. The corrected formal drawings incorporate the following changes:

- Figures 4A, 4B, 4C and 4D are amended to enhance consistency with the specification. More specifically, the glass substrate 4 is illustrated as being inclined at 85 degrees. Also, the advancing direction is indicated. Support can be found in at least paragraphs [0020] and [0021] of the specification as originally filed.
- Figures 10A, 10B and 10C are amended to enhance consistency with the specification. More specifically, the glass substrate 34 is illustrated as being inclined at 85 degrees. Also, grooves 44 are indicated. Further, the sliding portion is numbered as element 42. In addition, the advancing direction is indicated. Support can be found in at least paragraphs [0042] and [0047] of the specification as originally filed.

No new matter is added. Applicants respectfully requests that the corrected formal drawings be approved and made a part of the record of the above-identified application.

REMARKS

Favorable reconsideration and allowance of the present application are respectfully requested in view of the following remarks. Claims 1-14 were pending prior to the Office Action. Claims 13 and 14 are withdrawn from consideration. *See Office Action, item 5.* Claim 9 is canceled and claims 15 and 16 are added through this Reply. Therefore, claims 1-8, 10-12 and 15-16 are pending. Claim 1 is independent.

OBJECTIONS TO THE DRAWINGS

The Examiner objects to the drawings submitted on May 11, 2005. *See Office Action, item 2.* To address the Examiner's issues, Figures 10A, 10B and 10C are amended to show that the substrate 34 is inclined at 85 degrees. The amended figures are consistent with the specification. In paragraph [0042] of the specification as originally submitted, it is stated "the glass substrate 34 is placed on the surface of the susceptor with an angle of 85 degree ... the glass substrate 34 is safely placed on the susceptor 30 inclined to one side."

Figures 4A, 4B, 4C and 4D are amended for similar reasons. Again, the amendments are fully supported. In paragraph [0020] of the specification as originally submitted, it is stated "Also the robot arm 8 is inclined at around 85 degrees and moves up for safely placing the glass substrate 4 on surface of the susceptor 10."

The Examiner asserts that drawings to indicate the sequence of load and unload using the slide mechanism are required. The Examiner also asserts that the location and planar structure of the sliding portion and the groove to be shown clearly. The Examiner questions how the sliding of the substrate can take place on the susceptor where the lift pins lift and support to substrate. It appears that the Examiner is assuming the lift pins are extended out of the susceptor when the glass substrate is slid and therefore would interfere with the sliding process.

Additional figures are not needed as the Examiner asserts. The specification as originally submitted clearly describes the sliding process. In paragraph [0039] as originally filed, the specification states "The robot arm 35 transfers the glass substrate 34 to the process chamber 32 often the glass substrate 34 has been pre-heated in a heating chamber (not shown). After moving to the position of the process chamber 32, the robot arm 35 moves forward in an advance direction and places the glass substrate 34 on top of the susceptor 30. The lift pins 36 supporting the glass substrate 34 are inserted into the inside of the susceptor 30 whereby the glass substrate 34 is positioned on the surface of the susceptor 30." *Emphasis added.* Thus, as originally described, the lift pins 36 are inserted inside of the susceptor 30, i.e. the lift pins 36 are withdrawn out of the way. Because the lift pins are withdrawn out of the way, no interference from the lift pins occurs during the sliding process.

Thus, additional drawings to indicate the sequence of load and unload operations are not needed. Furthermore, the specification and the drawings are sufficient for explanation.

Applicant respectfully requests that the objections to the drawings be withdrawn.

OBJECTIONS TO THE SPECIFICATION

The Examiner alleges that the specification is replete with terms that are unclear. *See Office Action, item 3.* The Examiner also alleges that the sequence of load and unload operations using the sliding mechanism is not clearly described in the specification. Applicant respectfully submit that the changes as reflected in the Substitute Specification filed on October 19, 2004 as well as the amendments to the specification made in this Reply address all issues raised.

Applicant respectfully requests that the objections to the specification be withdrawn.

§ 112 FIRST PARAGRAPH REJECTION

Claims 1-12 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the enablement requirement. The basis of the rejection again appears to be due to the confusion regarding the load and

unload processing and the sliding operation in particular. As amply demonstrated above, these issues are fully addressed.

The Examiner also asserts that drawings and descriptions to indicate the sliding portion and its distance from an edge of the groove and the two planes of the sliding portion as recited in claim 12 are missing. The Examiner also questions how the substrate could slide on the two surfaces which are not coplanar. The Examiner appears to be misreading claim 12.

First, claim 12 recites, “a first planar portion,” “a second planar portion above the first planar portion,” and “wherein the groove is formed in the second planar portion, and wherein the glass substrate slides on the second planar portion.” There is no recitation of any type of distance from the groove to the two planar portions whatsoever. Further, claim simply recites that the glass substrates slides on the second planar portion. The claim does not recite that the glass substrate slides on both the first and second planar portions. Thus, contrary to the Examiner’s allegation, claim 12 is fully supported as recited. *See Figures 10A, 10B, or 10C.*

The rejection with regard to claim 9 is rendered moot since the claim is canceled.

Applicant respectfully requests that the rejection of claims 1-12 based on Section 112, first paragraph be withdrawn.

§ 102 REJECTION – TEPMAN

Claims 1-3, 9 and 11-12 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Tepman et al. (US Patent 5,589,224). *See Office Action, item 7.* The rejection with respect to claim 9 is rendered moot. With respect to the remaining claims, Applicant respectfully traverses.

Independent claim 1 recites, in part “a susceptor for heating a glass substrate.” The Examiner alleges that the support member 16 as disclosed in Tepman is equivalent to the susceptor as recited. However, it is noted that Tepman is completely silent regarding whether the support member 16 is used to heat the substrate 14. Thus, Tepman cannot teach or suggest the heated susceptor feature. This is sufficient to distinguish claim 1 over Tepman.

But in addition, claim 1 recites “a robot arm for transferring the glass substrate onto the susceptor and returning the glass substrate from the susceptor, wherein the robot arm slides the glass substrate on the sliding portion of the susceptor.” The Examiner alleges that the robot arm sliding on the susceptor “would” be an intended use since the standard robot arm “would” be capable of sliding a substrate on the susceptor. It appears the Examiner is alleging that the robot arm sliding the glass substrate is inherent in the device of Tepman. The allegation fails.

MPEP is clear that in order to establish inherency, the Examiner must provide rationale or evidence showing that the missing descriptive matter is

necessarily present. MPEP goes on to state, “Inherency, however, **may not be established** by probabilities or possibilities. The mere fact that a certain thing **may** result from a given set of circumstances **is not sufficient**.” Emphasis added; *See M.P.E.P. 2112 citing In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)*. In other words, a mere possibility that the feature may be present is not sufficient for rejection based on inherency.

In this instance, sliding does NOT occur in the device as disclosed in Tepman. Tepman describes an operation to load and unload the substrate 14 to and from the processing chamber 2 in column 5, lines 20-40. Tepman discloses that the robot blade 34 is inserted into the chamber over the support 16. *See column 5, lines 23-28*. Once positioned, the pins 30 of the support 16 are raised to lift the substrate 14 off of the robot blade 34. *See column 5, lines 28-30*. Then the robot blade 34 is withdrawn and the pins 30 are lowered onto the support 16 (more specifically onto the spacer support pins 35 of the support 16). *See column 5, lines 30-35*. The substrate 14 is not slid on the surface of the support 16 whatsoever.

As such, the sliding of the substrate 14 by the robot blade 34 is merely an Examiner’s speculation. Therefore, Tepman cannot teach or suggest the feature of the robot arm sliding the glass substrate on the sliding portion of the susceptor, inherently or otherwise.

Claims 2-3 and 11-12 depend from independent claim 1 directly or indirectly. Then for at least due to the dependency thereon, these dependent claims are also distinguishable over Tepman.

In the alternative, the dependent claims are also distinguishable on their own merits. It is noted that Tepman is entirely silent regarding the specific dimensions of the device such as the size of the support member 16, etc. Therefore, Tepman cannot teach or suggest the specific numerical features as recited in claims 2 and 3. Further, the Examiner does not even comment on regarding what features of Tepman he considers to be equivalent to the features as recited in claims 11 and 12.

Applicant respectfully requests that the rejection of claims 1-3, 9 and 11-12 based on Tepman be withdrawn.

§ 102 REJECTION – DUBOIS

Claims 1-3, 9 and 11-12 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by DuBois et al. (US Patent 5,855,687). *See Office Action, item 8.* The rejection with respect to claim 9 is rendered moot. With respect to the remaining claims, Applicant respectfully traverses.

Claim 1 recites “a robot arm for transferring the glass substrate onto the susceptor and returning the glass substrate from the susceptor, wherein the robot arm slides the glass substrate on the sliding portion of the susceptor.”

Again, the Examiner appears to be alleging that the feature of sliding the glass substrate with the robot arm is inherent.

DuBois suffers from a similar deficiency as that of Tepman. DuBois merely states "A wafer 28 is inserted into the chamber and placed onto the susceptor 26 by conventional robot arm and lift pins (not shown)." DuBois makes no other statement regarding the transfer mechanism employed. Based on the specific transfer mechanism described in Tepman as noted above, transferring the substrate need not involve sliding the glass substrate. Thus, the inherency fails and DuBois cannot teach or suggest the feature of the robot arm sliding the substrate on the susceptor.

Claims 2-3 and 11-12 depend from independent claim 1 directly or indirectly. Then for at least due to the dependency thereon, these dependent claims are also distinguishable over Tepman.

In the alternative, the dependent claims are also distinguishable on their own merits. DuBois clearly teaches that the recessed pocket 43 of the susceptor 26 is dimensioned to have a slightly larger diameter than the wafer. As an example, if the wafer is 150 mm in diameter, the diameter of the susceptor 26 ranges anywhere from 152.27 to 152.40 mm. *See DuBois, column 4, lines 4-14.* In other words, the maximum distance between the edge of the susceptor 26 and the edge of the substrate 14 is 1.2 mm $((152.40 - 150)/2 \text{ mm})$, which is much less than the numerical values recited in claims 2 and 3.

Further, the Examiner does not even comment regarding on what features of DuBois he considers to be equivalent to the features as recited in claims 11 and 12.

Applicant respectfully requests that the rejection of claims 1-3, 9 and 11-12 based on DuBois be withdrawn.

§ 103 REJECTION – CONVENTIONAL ART, TEPMAN

Claims 1-12 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the Conventional Art (CA) described in the specification in view of Tepman. *See Office Action, item 10.* Applicant respectfully traverses.

First, the CA is not admitted prior art as the Examiner alleges. Therefore, any rejection that includes the CA as a basis of the rejection cannot stand.

Second, the cited reference must be considered in its entirety including disclosures that teach away from the claimed invention. *See M.P.E.P. 2141.02.* If the cited reference(s) teach away from the claimed invention, then the combination is improper and the rejection must fail.

In this instance, Tepman teaches away from the feature of the robot arm sliding the glass substrate on the susceptor. The only detailed description of the loading and unloading process disclosed in Tepman clearly teaches that the robot blade 34 never slides the substrate 14. *See Tepman, column 5, lines 20-40.* In other words, Tepman teaches away from this feature.

Following is also noted. The Examiner relies on Figure 3 to allegedly teach the feature of a groove on the susceptor. More specifically, the Examiner alleges that a channel 38 on the support 16A is equivalent to the groove as recited. However, it is noted that the edge of the substrate 14 hangs over the channel 38, i.e, there is no room for the substrate 14 to be slid on the support 16A whatsoever. Thus, even under the Examiner's interpretation, Tepman teaches away from the feature of sliding the substrate.

In addition, one or more embodiments of the present invention are concerned with the effects of the glass substrate bending during transfer from the heat chamber to the processing chamber. In paragraph [0022] of the specification as originally filed, it is stated "Thereby, there occurs a problem whereby the glass substrate 4 is broken. The possibility of this occurrence increases because a bend of the substrate becomes severe due to the enlargement of the substrate."

The bending of the substrate – simply due to the weight increase corresponding to the size increase of the glass substrate – is a concern that must be addressed. One way to alleviate the physical stress is to slide the glass substrate as soon as practicable so that the weight of the glass substrate may be supported by the susceptor.

In contrast, Tepman does not even contemplate the possibility that the substrate may bend, and therefore would never contemplate the possibility of

sliding the substrate on the susceptor. This is logical since bending would not occur for substrates of small sizes.

Regarding Figure 3, Tepman discloses that spacer means 36 are provided in the support member 16. In Figure 3, it is clearly shown that the gap 50 is uniform from one edge of the substrate 14 to the other. This can only be possible if the substrate 14 does not bend, i.e. the substrate is small. Thus, Tepman does not contemplate the possibility of the substrate bending due to its own weight and size, and therefore would not contemplate sliding the substrate at all. Indeed, sliding the substrate would provide no benefits and would add disadvantages of the film build up in this situation. Consequently, Tepman teaches against sliding the glass substrate.

In summary, when the teachings are taken in their entirety as required in MPEP, Tepman teaches away from the claimed invention. Then by definition, there is no motivation to combine the CA with Tepman and any rejection based on CA and Tepman is improper.

Applicant respectfully requests that the rejection of claims 1-12 based on a combination of CA with Tepman be withdrawn.

§ 103 REJECTION – CONVENTIONAL ART, DUBOIS

Alternatively, claims 1-12 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the CA in view of DuBois. *See Office Action, item 10.* Applicant respectfully traverses.

Again, the CA is not admitted prior art as the Examiner alleges. Therefore, any rejection that includes the CA as a basis of the rejection cannot stand.

Further, DuBois also teaches away from the claimed invention. Like Tepman, there is simply no room on the susceptor 26 to slide the wafer 28. As noted above, the diameter of the susceptor 26 upto the recessed portion 43 is barely enough to support the wafer 28. *See DuBois, Figure 4.* The groove 44 defines the edge of the recessed portion 43. DuBois discloses that the function of the groove 44 is to act as a thermal choke of the susceptor 26. This effect is achieved when the cross sectional area of the susceptor 26 is reduced at the perimeter of the wafer 28. *See DuBois, column 4, lines 22-38.* In other words, DuBois specifically teaches that the groove 44 should be aligned with the edge of the wafer 28. In doing so, there would be no room left over for any type of sliding to take place. Consequently, DuBois teaches away from the feature of sliding the glass substrate on the susceptor.

Also like Tepman, DuBois never contemplates the possibility of the wafer 28 bending due to its own weight. The exemplary wafer 28 described in

DuBois is 150 mm (roughly 6 inches) in diameter. *See DuBois, column 4, lines 4-14.* For wafers of this size, bending is simply not an issue to be addressed. Clearly, DuBois does not contemplate sliding the substrate at all and consequently teaches against sliding the glass substrate.

In summary, when the teachings are taken in their entirety as required, and DuBois teaches away from the claimed invention. Then by definition, there is no motivation to combine the CA with DuBois and any rejection based on CA and DuBois is improper.

Applicant respectfully requests that the rejection of claims 1-12 based on a combination of CA with DuBois be withdrawn.

§ 103 REJECTION – TEPMAN, DUBOIS, NAKATA

Claims 4 and 10 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tepman in view of Nakata (US Patent 5,119,761). In the alternative, the same claims stand rejected as allegedly being unpatentable over DuBois in view of Nakata. *See Office Action, item 11.* Applicant respectfully traverses.

Claims 4 and 10 depend from independent claim 1 and it is demonstrated above that claim 1 is distinguishable over Tepman and over DuBois. Nakata is not relied upon to correct for at least the above-noted deficiencies of Tepman or DuBois. Thus, claim 1 is distinguishable over the

combination of Tepman and Nakata and over the combination of DuBois and Nakata. Due to the dependency thereon or on its own merits, claims 4 and 10 are also distinguishable over the combination of Tepman and Nakata and over the combination of DuBois and Nakata.

Applicant respectfully requests that the rejection of claims 4 and 10 based on Tepman, DuBois and Nakata be withdrawn.

§ 103 REJECTION – TEPMAN

Claims 5-8 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tepman. *See Office Action, item 12.* Applicant respectfully traverses.

Claims 5-8 depend from independent claim 1 and it is demonstrated above that claim 1 is distinguishable over Tepman. Due to the dependency thereon or on their own merits, claims 5-8 are also distinguishable over Tepman.

Applicant respectfully requests that the rejection of claims 5-8 based on Tepman be withdrawn.

NEW CLAIMS

Claims 15 and 16 are added through this reply. All new claims are believed to be distinguishable over the cited references, individually or in any combination. Applicant respectfully requests that the new claims be allowed.

CONCLUSION

All objections and rejections raised in the Office Action having been addressed, it is respectfully submitted that the present application is in condition for allowance. Should there be any outstanding matters that need to be resolved, the Examiner is respectfully requested to contact Hyung Sohn (Reg. No. 44,346), to conduct an interview in an effort to expedite prosecution in connection with the present application.

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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachments: Three (3) Replacement Sheets